Preventing West Nile Virus in Horses & Horse Owners

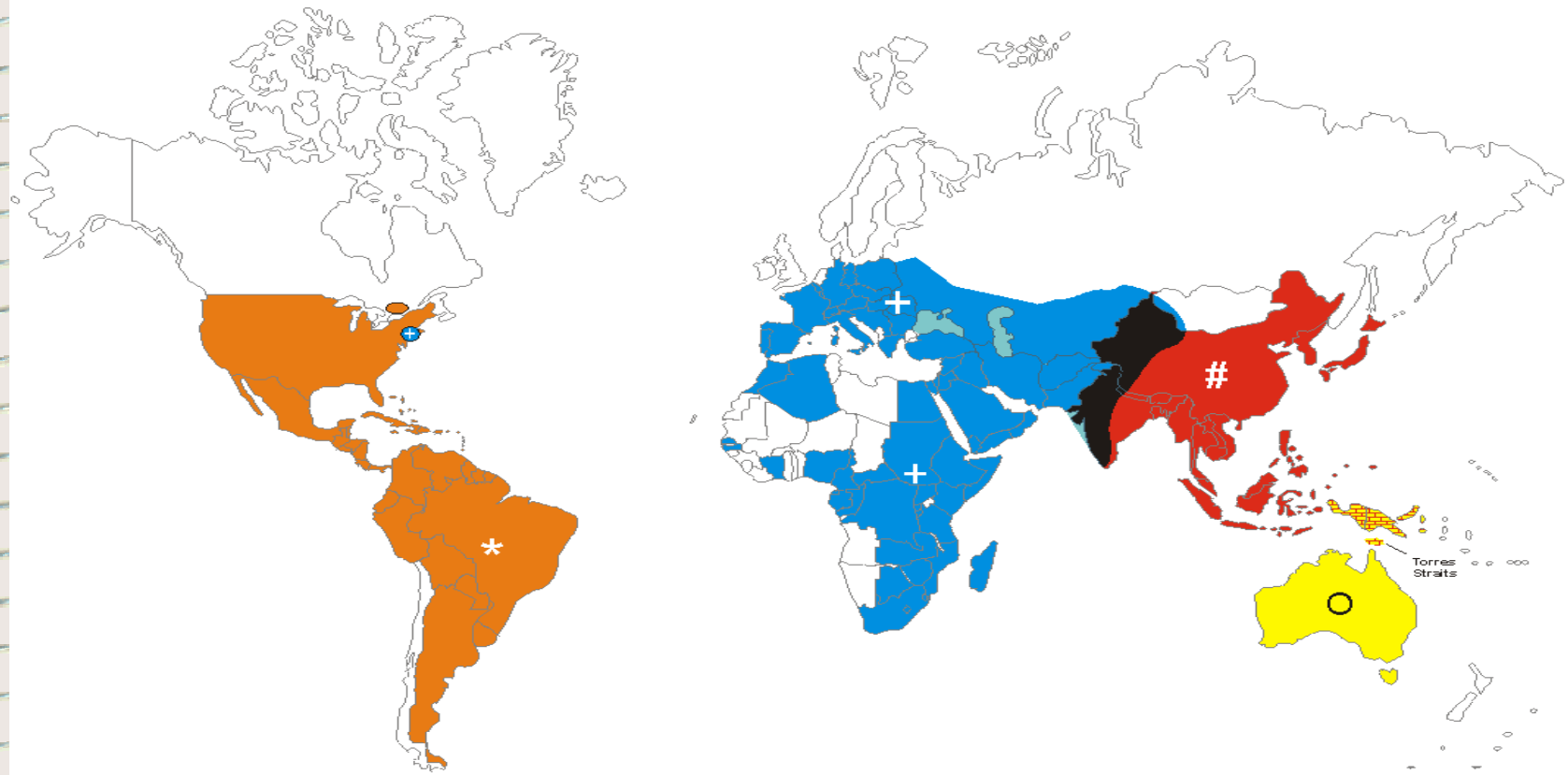
OHIO WNV
West Nile Virus
WORKGROUP

THE OHIO STATE UNIVERSITY EXTENSION

West Nile Virus (WNV)

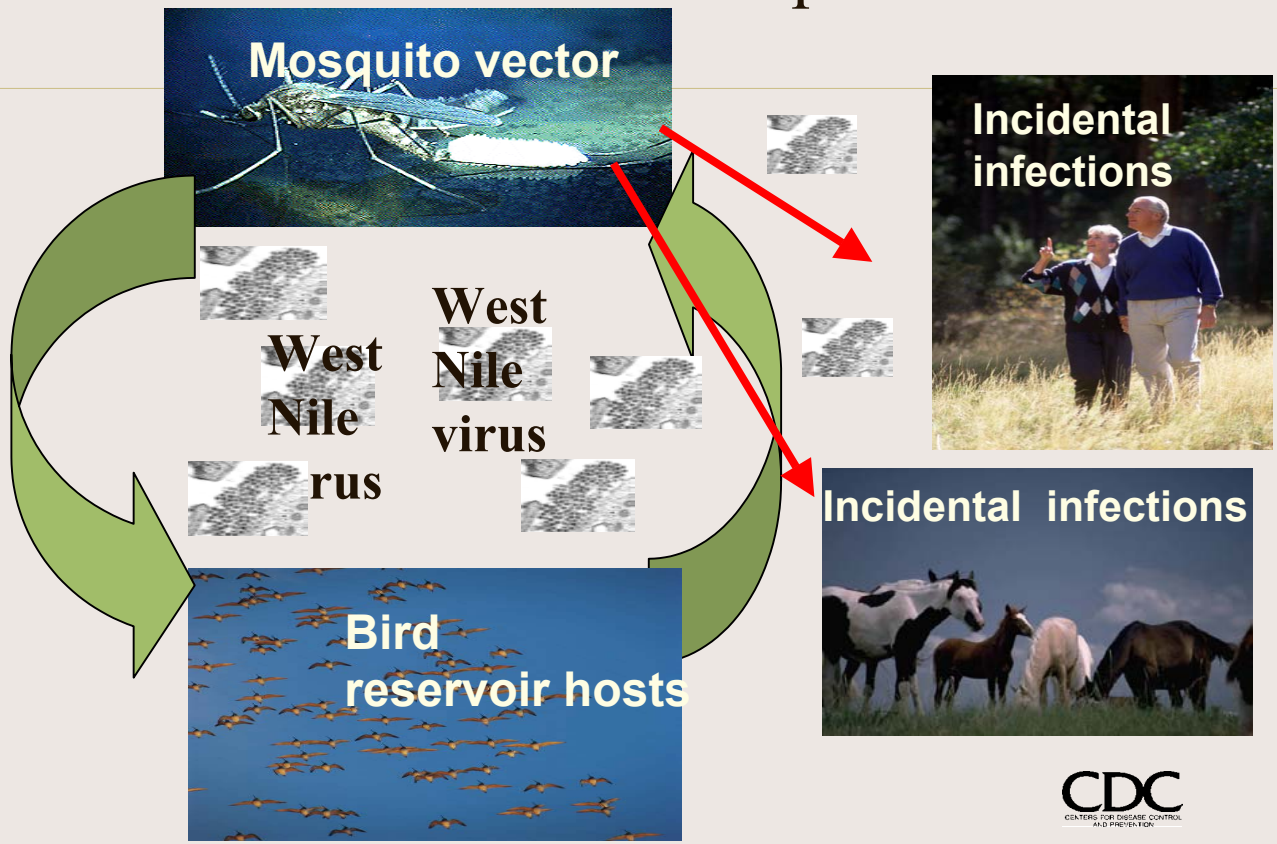
- WNV is a member of the flavivirus family of the Japanese Encephalitis virus serocomplex
- WNV may cause severe encephalitis (brain or spinal cord disease) in humans, horses and birds, particularly crows and blue jays

The Geographic Distribution of the Japanese Encephalitis Serocomplex of the Family Flaviridae, 2000.



- St. Louis encephalitis
- * Rocio and St. Louis (Brazil)
- + West Nile virus
- # Japanese encephalitis
- West Nile and Japanese encephalitis
- Japanese and Murray Valley encephalitis
- O Murray Valley and Kunjin

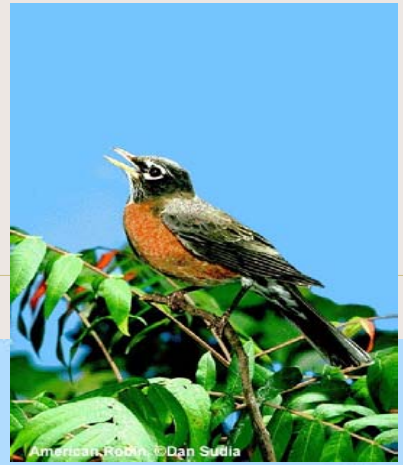
West Nile Virus (WNV) normally circulates between wild birds and mosquitoes



Humans can also get the virus. Horses are particularly susceptible. People and horses do not pass on the virus.

WNV

- Bird Reservoir
  - Birds are the reservoir - the animal species in which the virus is maintained
  - Greater than 80 species of birds have been found infected in North America
  - Members of the *Corvid* spp (crows and blue jays) are unusually susceptible to illness and frequently die from the disease.



Avian Reservoir

WNV

- WNV is transmitted by mosquitoes, the primary species being *Culex pipiens and Culex tarsalis*
- WNV has been detected in >20 species of mosquitoes in North America
- Therefore, protection against mosquito bites is very important

Mosquitoes Infected with WNV

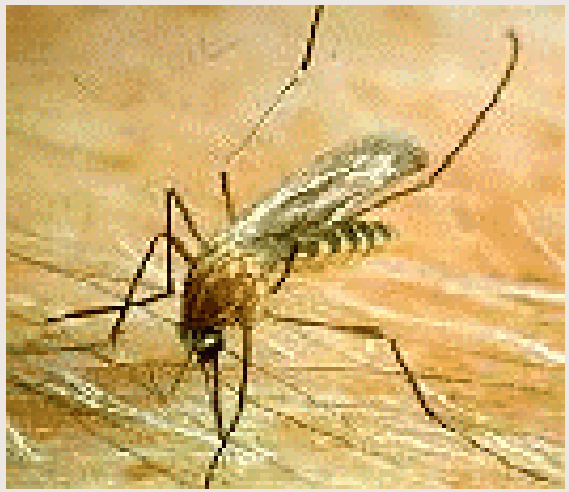
Culex

Pipiens

Restuans

Salinarius

C. tarsalis



Aedes

Albopictus
Cantator
Japonicus
Triseriatus
Vexans

Bird Feeders

Mammal Feeders

Culex pipiens

- Female mosquito with raft of eggs
- Up to 500 eggs/raft

WNV

- 1st equine outbreak 1962-65 in France
- Also 1963 in Egypt, Morocco in 1996, Israel and Italy in 1998
- Morocco – 42/94 = 44.7% of horse cases died
- Italy – 6/14=42.9% of horse cases died

WNV in US

- 1999 - 25 equine cases/9 deaths; 9/25=36%
- 2000 – 60 equine cases/23 deaths; 23/60=38%
- 2001 – 731 equine cases/71 deaths so far;
  71/295=24.1% as of 12/08/01
- 2002 – Approximately 12,000 equine cases

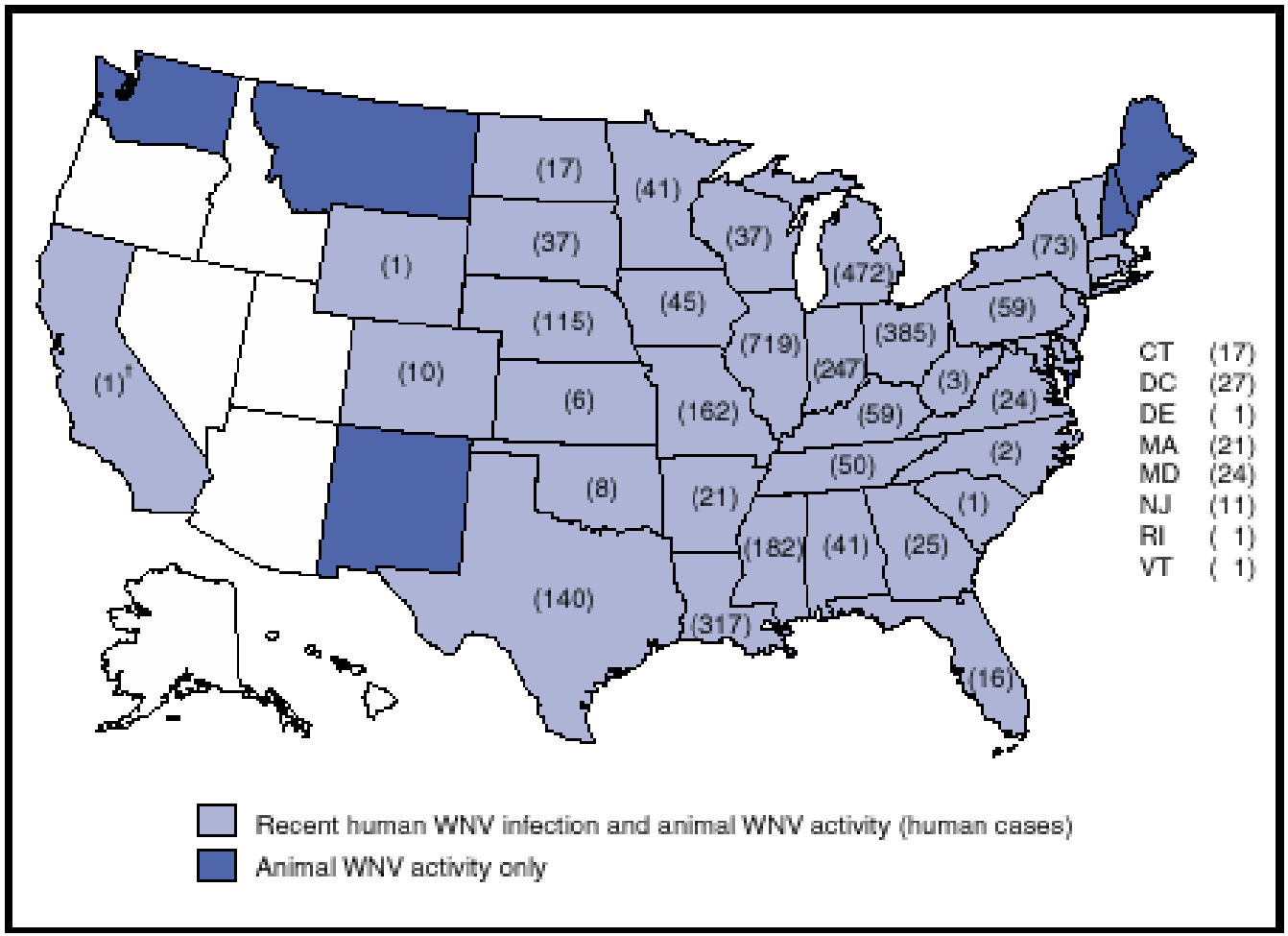
WNV in US

- 2001 Outbreak
  - 28 states & DC
  - 66 humans with 9 fatalities
  - 731 horses in 19 states
  - 7,338 birds all states & DC
  - 918 mosquito pools in 15 states & DC

WNV in U.S.

- 2002 (as of Nov. 1, 2002)
  - 43 STATES AND DC
  - 3,419 HUMAN CASES, 188 DEATHS IN 38 STATES & DC
  - 12,000 HORSES
  - 12,436 DEAD BIRDS
  - 4,782 MOSQUITO POOLS IN 26 STATES & DC

FIGURE. Areas reporting West Nile virus (WNV) activity — United States, 2002*



* As of 7 a.m. Mountain Standard Time, October 30, 2002.
† California has reported human WNV activity only.

Common Clinical Signs

- Ataxia (incoordination)– 85% of cases
- Depression or apprehension – 50% of cases
- Weakness – 48% of cases
- Recumbency (down) – 45% of cases
- Muscle fasciculations – (neck & body) 40% of cases
- Fever – 23% of cases
- Paralyzed or droopy lip – 18% of cases
- Twitching muzzle – 13% of cases
- Teeth grinding – 7% of cases
- Blindness – 5% of cases

Other Similar Diseases

- EEE, WEE, VEE
- Rabies
  - Ascending paralysis (from rear to front)
- Botulism
  - Severe muscle shaking (head, trunk, muzzle)
- Equine Protozoal Myeloencephalitis (EPM)
  - Asymmetric incoordination and weakness

Diagnosis

- Diagnosis may be made using paired serum samples or cerebrospinal fluid, or
- Brain and Spinal Cord at necropsy
- Samples should be sent to Utah Veterinary Diagnostic Lab
- Post mortems should not be done in the field, but should be done at the Lab as well

CASE DEFINITION

- CONFIRMED CASE
  * Compatible Clinical Signs, plus 1 of :
  - virus isolation from tissues, or
  - 4-fold change in PRNT, or
  - + I_gM-capture ELISA and 1:10 PRNT, or
  - + I_gM-capture ELISA and IHC positive, or
  - IHC positive + PCR positive

WNV Treatment

- Supportive only – fluids, anti-inflammatory medications, nutrients, sling
- No antiviral medications are available at this time

Can my horse infect me?

- No, not likely, as the level of virus in the blood is too low.
- 3 studies have been attempted with 16 horses
  - >600 naïve mosquitoes were fed on 7 infected horses.
  - None of the mosquitoes became infected
- Since we don't know about severely affected horses, caution should always be taken.

WNV Prevention

- There is currently a vaccination available for horses
- Horses should receive 2 initial doses, 3 to 6 weeks apart
- Second dose no later than April 15th
- If vaccinated early in year, should receive a booster in July

Vaccine Efficacy

- Unknown at this time
- In the same serocomplex as Japanese Encephalitis (JE) virus
- JE vaccine has proven very effective in horses and people
- Therefore, it is expected the current WNV vaccine will be effective

WNV Prevention

- No vaccine is 100% effective, therefore mosquito control is necessary both for the horses and their owners

- Reducing the sources for mosquito breeding both around your house and other areas around your farm and personal protection will help to reduce the risk for WNV infection

Personal Protection

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Keep swimming pools clean or covered

Eliminate water collecting depressions in tarps

Clean bird baths once a week

Keep ornamental pots and plant saucers free of standing water

Keep Gambusia fish in ornamental ponds

Keep gutters clean of debris

Cover open boats

Repair leaking watering equipment

Store anything that can hold water for more than a few days

Prevent old tires from collecting water

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Protect Yourself from Biting Mosquitoes

- Wear long, loose and light-colored clothing.
- Use insect repellent with no more than 20-30% DEET for adults and less than 10% for children.


Most horse farms have multiple mosquito breeding areas!

WNV Prevention

- Stagnant pools should be drained or larvicide's should be used

WNV Prevention

- Mosquito dunks are non-toxic, biological mosquito control
- May be safely used in horse water troughs

WNV Prevention

- Mosquito magnet
- Offers coverage up to 1 acre
- Attracts the mosquitoes and then dries them up
- Expensive

WNV Prevention

- Remove old tires as mosquitoes love to breed in them
- If you must keep them, cut them in half or treat them

WNV Prevention

- Whole tires should not be used on silos

WNV Prevention

- Split tires are much safer for mosquito reduction

WNV Prevention

- Old equipment where stagnant water may accumulate should be emptied, turned over or removed

WNV Prevention

- Old tubs or water troughs not in use should be turned over or trashed

WNV Prevention

- Keep vegetation down at the edge of ponds or lagoons

WNV Prevention

- Ponds and lagoons should be kept free of debris

WNV Prevention

- Keep horses inside during high mosquito activity
- Lights off at night
- Use fans
- Put incandescent lights on outside of farm property

WNV Prevention

- Keep all birds away from the barn
- Remove any potential reservoir
- www.birdbgone.com

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Web site: http://prevmed.vet.ohio-state.edu